AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

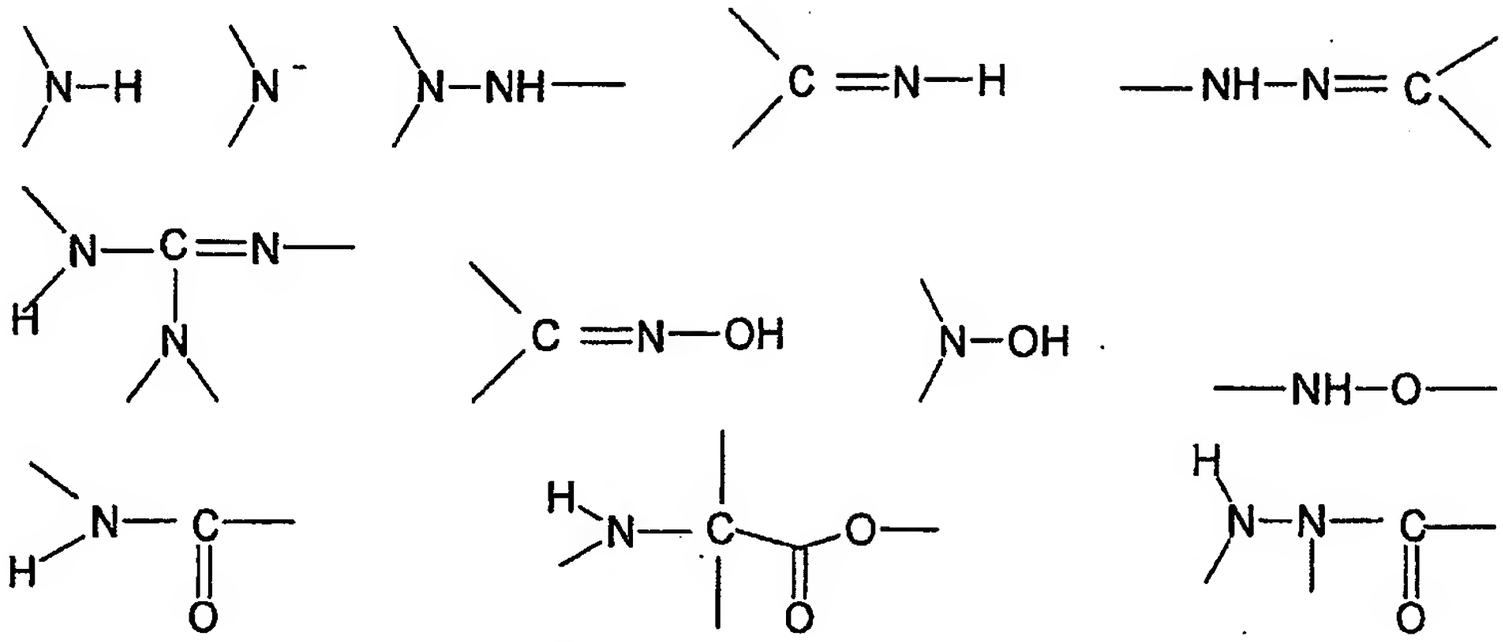
Listing of Claims:

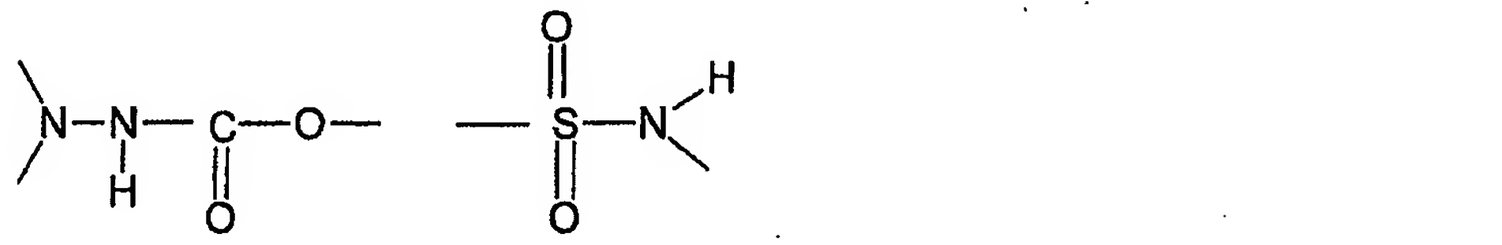
1-29 (Canceled)

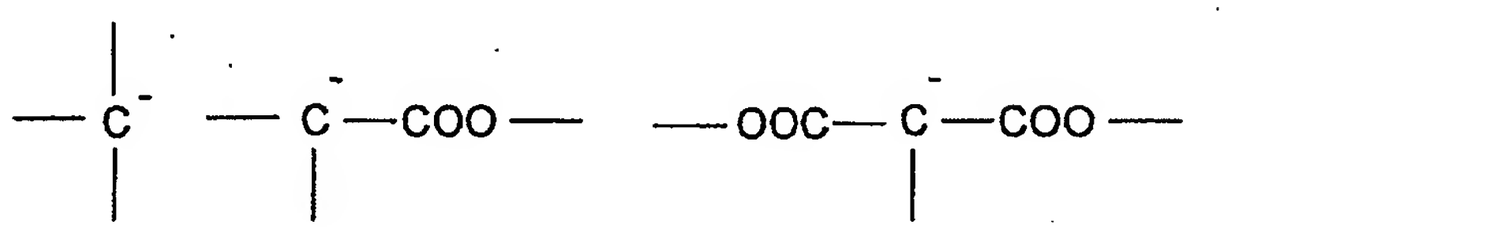
30. (New) A method for creating a carbon-carbon or carbon-heteroatom bond by the reaction of an unsaturated compound carrying a leaving group and a nucleophilic substrate or compound donating a carbon atom or a heteroatom (HE) capable of substituting for the leaving group, thus creating a C-C or C-HE bond, in the presence of a copper-based catalyst and a base, the reaction taking place in the absence of a ligand and in a nitrile solvent.

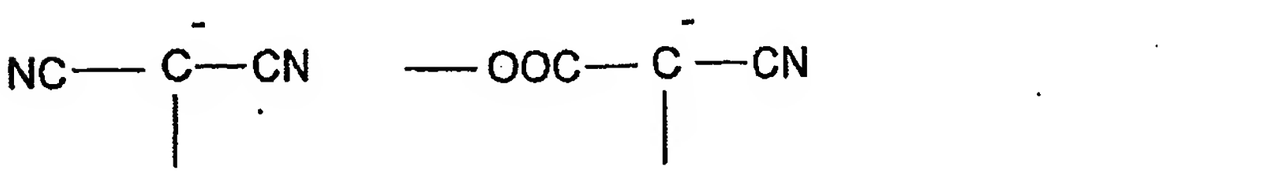
31. (New) The method as claimed in claim 30, wherein the nucleophilic substrate is an organic hydrocarbon compound which is acyclic or cyclic and whose characteristic is to comprise at least one atom carrying a free doublet optionally having a charge, and optionally a nitrogen, oxygen, sulfur, phosphorus or carbon atom.

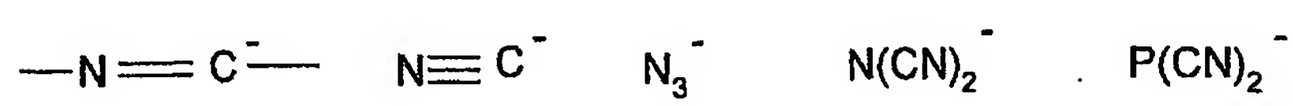
32. (New) The method as claimed in claim 30, wherein the nucleophilic substrate has at least one atom or group below:

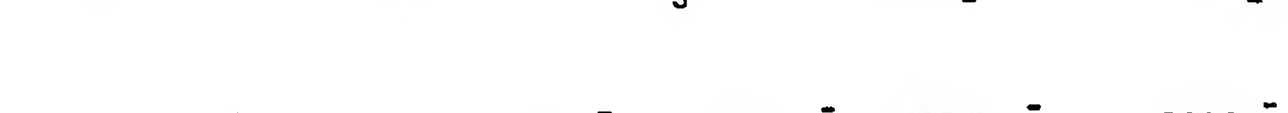


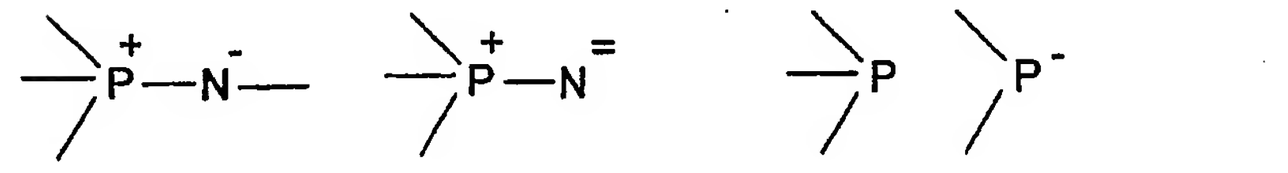








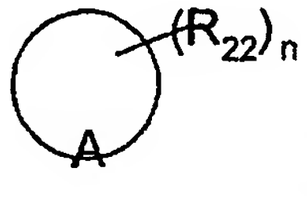




33. (New) The method as claimed in claim 30, wherein the nucleophilic substrate has at least one nitrogen atom carrying a free doublet contained in a saturated, unsaturated or aromatic ring: the ring optionally having from 3 to 8 atoms.

34. (New) The method as claimed in claim 31, wherein the nucleophilic substrate is a primary or secondary amine; an imine; an oxime; a hydroxylamine; a hydrazine; a hydrazone; an amide; a sulfoamide; a urea derivative; an amino acid; or a heterocyclic derivative, optionally containing nitrogen, sulfur or phosphorus.

35. (New) The method as claimed in claim 31, wherein the nucleophilic substrate corresponds to the following formula:



(Ik)

wherein:

A symbolizes the residue of a ring forming all or part of a monocyclic or polycyclic, aromatic or nonaromatic heterocyclic system in which one of the carbon atoms is replaced by at least one nucleophilic optionally a nitrogen, sulfur or phosphorus atom,

R_{22}, which are identical or different, represent substituents on the ring, and

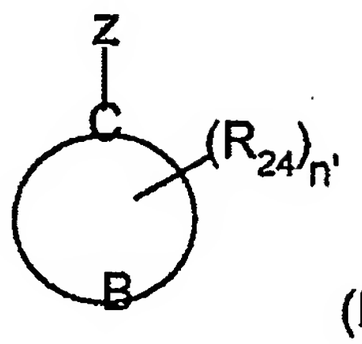
n represents the number of substituents on the ring.

36. (New) The method as claimed in claim 35, wherein the nucleophilic substrate corresponds to formula (Ik) in which A represents a imidazole, pyrazole, triazole, pyrazine, oxadiazole, oxazole, tetrazole, indole, pyrrole, phthalazine, pyridazine, or oxazolidine ring.

37. (New) The method as claimed in claim 31, wherein the nucleophilic substrate is an alcohol or thiol compound, optionally a hydroxy or thioaromatic compound.

38. (New) The method as claimed in claim 37, wherein the nucleophilic substrate

corresponds to the following formula:



(Im_1)

in which:

B symbolizes the residue of a monocyclic or polycyclic aromatic carbocyclic group or a divalent group consisting of a succession of two or more monocyclic aromatic carbocyclic groups,

R_{24} represents one or more substituents which are identical or different,

Z represents a group of the OM_1 or SM_1 type in which M_1 represents a hydrogen atom or a metal cation, optionally an alkali metal cation, and

n' is a number less than or equal to 5.

39. (New) The method as claimed in claim 31, wherein the nucleophilic substrate is a hydrocarbon compound having a nucleophilic carbon, optionally a malonate, a cyanomalonate, or a malodinitrile, a compound having a cyanide anion or its generator, an acetylenide, a profen compound, a nucleophilic compound having a carbanion and whose counter-ion is a metal, optionally lithium, sodium, magnesium or zinc.

40. (New) The method as claimed in claim 31, wherein the nucleophilic substrate is a phosphide, a phosphine, a phosphonium azayldiide, or a phosphonium azaylide.

41. (New) The method as claimed in claim 30, wherein the nucleophilic compound

is: pyrazole, oxazolidin-2-one, phenylsulfonamide, 3,5-dimethylphenol, dimethyl malonate or diethyl malonate.

42. (New) The method as claimed in claim 30, wherein the compound carrying a leaving group Y is symbolized by the formula (II):

$$R_0\text{-}Y \quad (II)$$

wherein:

R_0 represents a hydrocarbon group having from 2 to 20 carbon atoms and possesses a double bond at the α-position with respect to a leaving group Y or a monocyclic or polycyclic aromatic carbocyclic and/or heterocyclic group carrying a leaving group Y on a ring.

43. (New) The method as claimed in claim 42, wherein the compound having a leaving group corresponds to formula (II) in which:

R_0 represents an aliphatic hydrocarbon group having a double bond at the α-position with respect to the leaving group or an unsaturated cyclic hydrocarbon group in which an unsaturation carries the leaving group,

R_0 represents a monocyclic or polycyclic aromatic carbocyclic and/or heterocyclic group, and

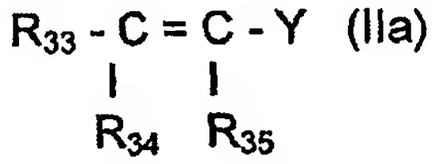
Y represents a leaving group, optionally a halogen atom or a sulfonic ester group of formula $-OSO_2\text{-}R_e$, in which R_e is a hydrocarbon group.

44. (New) The method as claimed claim 42, wherein the leaving group corresponds to formula (II) in which Y represents a bromine or chlorine atom or a sulfonic ester of

formula $-OSO_2-R_e$, in which R_e is a linear or branched alkyl group having from 1 to 4 carbon atoms, optionally a methyl or ethyl group, a phenyl or tolyl group or a trifluoromethyl group.

45. (New) The method as claimed in claim 42, wherein the compound having a leaving group corresponds to formula (II) and is:

(1) a compound carrying a double bond represented by the formula (IIa):



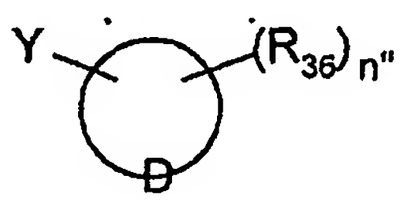
(IIa)

in said formula (IIa):

R_{33}, R_{34} and R_{35}, which are identical or different, represent a hydrogen atom or a hydrocarbon group having from 1 to 20 carbon atoms, which is a saturated or unsaturated, linear or branched aliphatic group; a monocyclic or polycyclic, saturated, unsaturated or aromatic carbocyclic or heterocyclic group; a succession of aliphatic and/or carbocyclic and/or heterocyclic groups as mentioned above, and

Y symbolizes the leaving group as defined above, or

(2) a haloaromatic compound represented by the formula (IIb)



(IIb)

in which:

D symbolizes the residue of a ring forming all or part of a monocyclic

or polycyclic aromatic carbocyclic and/or heterocyclic system,

R_{36}, which are identical or different, represent substituents on the ring,

Y represents a leaving group as defined above, and

n" represents the number of substituents on the ring.

46. (New) The method as claimed in claim 42, wherein the compound carrying a leaving group corresponding to formula (II) is vinyl chloride, vinyl bromide, β-bromostyrene, β-chlorostyrene, bromobenzene, iodobenzene, p-chlorotoluene, p-bromoanisole, or p-bromotrifluorobenzene.

47. (New) The method as claimed in claim 42, wherein the compound carrying a leaving group corresponding to formula (II) is bromobenzene or iodobenzene.

48. (New) The method as claimed in claim 30, wherein the reaction takes place in the presence of a base which is a carbonates, hydrogen carbonate, hydroxide of alkali metals, or of alkaline-earth metal, alkali metal hydrides, alcoholate of alkali metals, methoxide, ethoxide, tert-butoxide; or a tertiary amine.

49. (New) The method as claimed in claim 30, wherein the reaction takes place in the presence of a nitrile solvent of the formula:

$$R_h\text{-}CN \qquad (III)$$

in said formula (III):

R_h represents a hydrocarbon group comprising at least one nitrile group, having from 1 to 24 carbon atoms, optionally substituted, saturated or unsaturated, linear or branched acyclic aliphatic group; a monocyclic or polycyclic, saturated, unsaturated or aromatic cycloaliphatic group; a saturated or

unsaturated, linear or branched aliphatic group, carrying a cyclic substituent.

50. (New) The method as claimed in claim 49, wherein the nitrile solvent is aceto-nitrile, propionitrile, butanenitrile, isobutanenitrile, pentanenitrile, 2-methylglutaronitrile, adiponitrile, benzonitrile, tolunitrile, malonitrile, or 1,4-benzonitrile.

51. (New) The method as claimed in claim 30, wherein the the arylation or vinylation reaction is carried out at a temperature of between 0°C and 120°C, optionally between 25°C and 85°C.

52. (New) The method as claimed in claim 30, wherein the copper catalyst is copper(I) bromide, copper(II) bromide, copper(I) iodide, copper(I) chloride, copper(II) chloride, basic copper(II) carbonate, copper nitrate, copper nitrate, copper sulfate, copper sulfate, copper(I) sulfite, copper(I) oxide, copper(II) oxide, copper(I) acetate, copper(II) acetate, copper(II) trifluoromethylsulfonate, copper(II) hydroxide, copper(I) methoxide, copper(II) methoxide, or chlorocopper(II) methoxide of formula $ClCuOCH_3$.

53. (New) The method as claimed in claim 30, wherein the catalyst is copper(I) iodide.

54. (New) The method as claimed in claim 30, wherein the catalyst is used in a quantity, expressed by the molar ratio between the number of moles of copper catalyst expressed as copper and the number of moles of compound carrying the leaving group, of between 0.001 and 0.2, optionally between 0.01 and 0.1.

55. (New) The method as claimed in claim 30, wherein the nitrile-type solvent is

used in a quantity such that the concentration of the compound carrying the leaving group in the organic solvent is between 0.5 and 2 mol/liter of organic solvent.